TWO NEW SPECIES OF *PETTIBONEIA* AND *PROTODORVILLEA* (DORVILLEIDAE, POLYCHAETA) FROM NORTHERN CHILE

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ABSTRACT

Two new species of small dorvilleids, belonging to the genus *Pettiboneia* Orensanz and *Protodorvillea* Pettibone, have been collected and described from a sublittoral sandy soft-bottom area near Antofagasta, northern Chile. Both genera had not been reported previously from Chilean coast. *Pettiboneia wui* n. sp. is related to *P. sanmatiensis* Orensanz, 1973 and *P. urciensis* Campoy and San Martín, 1980, but differs from these species in the shape of the mandibles, maxillae, including sclerotized elements with long and curved spines, setae, and especially forked setae. *Protodorvillea orensanzi* n. sp. is close to *P. kefersteini* (McIntosh, 1869) but differs from this form mainly in the shape of parapodia, forked setae, and especially from mandibles and maxillae, the latter presenting large and curved superior free denticles.

During monitoring surveys off Antofagasta, northern Chile, small dorvilleid individuals appeared in sublittoral benthic samples at a sandy soft-bottom station (ca 40 m depth). Clearly the specimens, which showed comparable body sizes, were of two types. The specimens belonged to two different genera: *Pettiboneia* Orensanz and *Protodorvillea* Pettibone and following close scrutiny they appeared to be two new species. The two genera have not previously been reported from Chilean waters, although another *Protodorvillea* form (*Protodorvillea* sp.) was listed by Hartman (1967) for southern South America (Tierra del Fuego). The two forms here reported tend to coexist in the bottom samples with *Protodorvillea* more abundant.

Material and Methods

The benthic samples were taken half-yearly, summer and winter since 1990, using a 0.1 m^2 Petersen grab. The macrofauna was separated from the sediment at the laboratory by means of a 0.5 mm geological sieve. The sediment was dominated by coarse to medium sands with variable quantities of shell debris. The samples were immediately fixed after collection in 10% seawater formalin, then Rose Bengal dye was added before sorting. The sorted individuals were transferred to 70% ethanol. These small dorvilleids were studied under stereomicrocopes and compound microscopes. To examine the jaw structures the whole animal was cleared in a 20% KOH solution for about 30 min, then mounted in 70% ethanol-glycerol solution. Details of the setae were examined under oil immersion.

Family Dorvilleidae Chamberlin, 1919
Genus *Pettiboneia* Orensanz, 1973
Pettiboneia wui new species
(Fig. 1A–J)

Material Examined.—Chile: Antofagasta, off Punta Coloso, subtidal, ca 40 depth, coarse to medium sands, holotype (MZUC 25072) and nine paratypes (MZUC 25073-25081) (type series numbers of the Zoological Museum of the Concepción University, Chile).

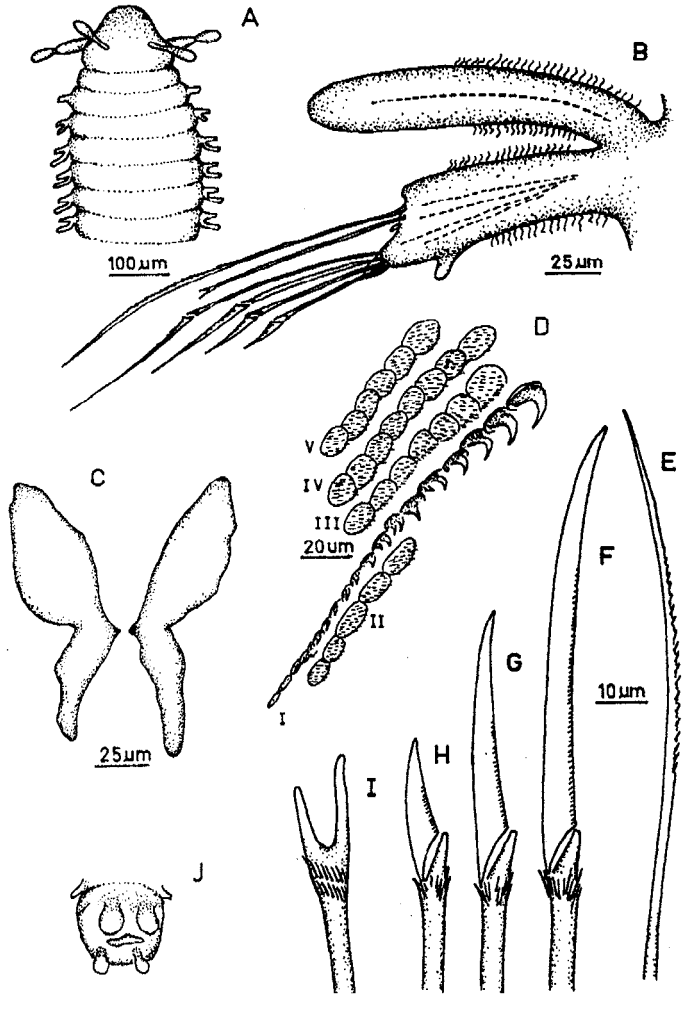

Figure 1. *Pettiboneia wui* n. sp. A. Anterior end, dorsal view. B. Anterior parapodium (setiger 5). C. Mandibles. D. Maxillary apparatus consisting of five pairs of denticle rows (I to V). E. Serrated capillary seta. F–H. Composite falciger setae. I. Furcate seta. J. Pygidium.

Description.—A small, slender, thread-like species, measuring up to 5.0 mm long and 0.25 mm wide for 45 setigers. Individual organisms appear with a very marked coiling. Prostomium short, bluntly triangular, truncated on posterior margin;anteriorly heavily dark pigmented and with no eyes; antennae small, simple, sub-clavate; palps well developed, biarticulate (Fig. 1A). Peristomium single achaetous ring; setiger 1 lacking dorsal cirrus, which starts on setiger 2, relatively small at first, increasing to full size by setiger 5; dorsal cirri large and elongated extending to setigers 12–13, each bearing a thin notoaciculum (Fig. 1A,B). Neuropodia without distal dorsal lobes or branchiae; ventral cirri very short, stubby; neurosetae including a thick neuroaciculum, sometimes protruding through cuticle, a single furcate seta, with uneven branches, one longer and more curved the than other with subdistal spinulations arranged in two rows (Fig. 1I), a single

long serrated capillary seta (Fig. 1E), and 3–4 heterogomph composite setae grading in a series from short falcigers to long spinigers (Fig. 1F–H); each composite seta with finely serrated cutting edge on blade, a lot of small spinelets on end of shaft and a thin membrane connecting shaft and blade. Body ending in four short anal cirri, each clearly clavate (Fig. 1J). Jaw apparatus consisting of a pair of mandibles (Fig. 1C); maxillae with one row of sclerotized elements, with some of them bearing large and curved spines, and 4 rows of spinulate plates on each side (Fig. 1D); carriers lacking. Basal denticles of pair I not fused, narrowly pointed with a single tooth gradually developing over subsequent denticles, mid to distal denticles with very long and large spines, as fangs, and without spinelets; pair II with 5 denticles, each covered with numerous spinelets; pair III with 7 denticles, each also with a lot of spinelets; pair IV with 8 denticles, each with numerous spinelets; pair V with 6 denticles and also bearing spinelets.

Remarks.—This species is close to *P. sanmatiensis* (Orensanz, 1973; Blake, 1979), but differs in the absence of eyes, in having only 1 achaetous segment (peristomium), in the form of parapodia (dorsal cirri are larger and ventral cirri are shorter) and mandibles, in the number and form of maxillary denticle rows and in the form of furcate and compositae setae. From *P. urciensis* Campoy and San Martín, 1980 it differs also in bearing only 1 achaetous segment, shorter presetal lobes and smaller ventral cirri and also in the form of mandibles and maxillae. From *P. dibranchiata* differs in the absence of distal dorsal neuropodial lobes (or branchiae) and having a more massive dorsal cirri, and in the form and structures of mandibles and maxillary apparatus. From *P. hartmanae* Orensanz, 1990, the new species it differs in the form of mandibles, maxillae, pygidium (4 papillae instead of 2), in the form of furcate setae, and in having dorsal cirri in a larger number of setigers (1–2 to 6–8 vs 2 to 12–13). From *P. australiensis* Westheide and von Nordheim, 1985, it differs mainly in the shape of the mandibles and maxillae. From *P. pugettensis* (Blake and Hilbig, 1990) the new species differs in having a longer dorsal cirri and in the shape of mandibles and maxillae, including sclerotized elements with long and curved spines. From *P. brevipalpa* it differs in the form of prostomium, in having only 1 achaetous segment, with larger and longer dorsal cirri and shorter ventral cirri, in the different shape of the mandibles and sclerotized elements (no curved spines). Finally, from *P. bathialis* Hilbig and Ruff, 1990, the new species differs in the form of prostomium, having only 1 achaetous segment, parapodia with a short and smaller ventral cirri, also differs in the shape of mandibles, presence of sclerotized elements with long and curved spines and the form of furcate seta.

Etymology.—The species is named in honor of late Prof. Bao-ling Wu, a well-known Chinese polychaetologist.

Genus *Protodorvillea* Pettibone, 1961
Protodorvillea orensanzi new species
(Fig. 2A–K)

Material Examined.—Chile: Antofagasta, off Punta Coloso, subtidal, ca 40 m depth, coarse to medium sands, holotype (MZUC 25082) and nine paratypes (MZUC 25083-25091) (type series numbers of the Zoological Museum of the Concepción University, Chile).

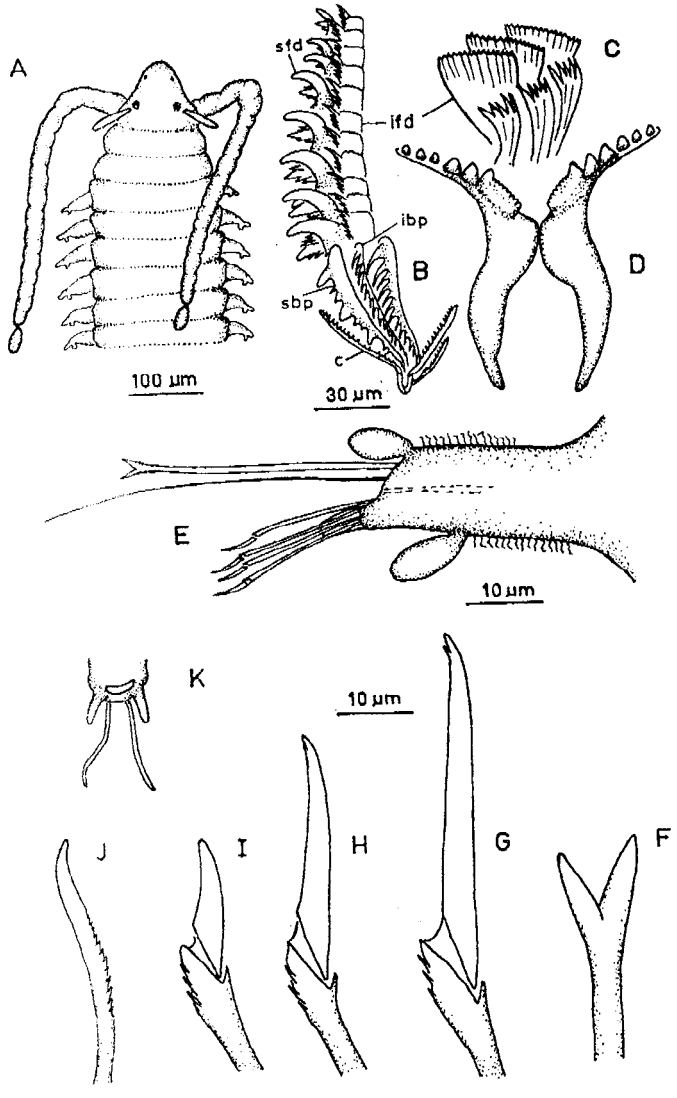

Figure 2. *Protodorvillae orensanzi* n. sp. A. Anterior end, dorsal view. B. Maxillary apparatus consisting of two pairs of basal plates and two paired rows of free denticles.c: carrier, sbp: left superior basal plate, ibp: left inferior basal plate, sfd: superior free denticles, ifd: inferior free denticles. C. Distal end of right inferior and superior row of free denticles. D. Mandibles. E. Anterior parapodium (setiger 3) with dorsal and ventral clavate cirri. F. Furcate seta. G–I. Composite spiniger setae. J. Cultriform seta. K. Pygidium.

Description.—A very small, slender species, measuring up to 4.0 mm and 0.25 mm wide for 44 setigers. Prostomium about as long as wide, generally flattened dorsoventrally, subtriangular, bluntly conical anteriorly (Fig. 2A). Antennae simple and originating on posterior half of prostomium, about one third as long as greatest prostomial width. Palps originating ventrolaterally, in the middle of prostomium, about equal in length to first 12 segments. Eyes usually 2 pairs; posterior pair larger, without lens, arranged at the

same level of the origin of palps, anterior and slightly lateral to origin of antennae; anterior pair much smaller, apparently subdermal. Peristomium composed by 2 apodous rings, each slightly narrower and about as long as following segments. Parapodia uniramous, without notoaciculae, supported by single neuroacicula, subcylindrical, with clavate dorsal and ventral cirri near tips, with dorsal cirri more distal than ventral, with indistinct presetal and postsetal lobes (Fig. 2E), and with subacicular setal lobe often more elongate than supraacicular lobe. Setae of 5 types: (1) 1 upper setae simple serrate capillary; (2) furcate seta (Fig. 2F); with almost equally long, wide and distally unidentate tines, (3) cultriform seta replacing furcate seta in last (or 2) posterior segments (Fig. 2J); (4) subacicular compound falcigers with bidentate tips in large ones, 4–5 in anterior parapodia, 2–3 in posterior (Fig. 2G–I); (5) lower simple seta in posterior few segments. Upper falcigerous blades longer, lower blades shorter; bidentate tips with secondary tooth subequal to primary tooth. Cultriform setae curved and serrated. Pygidium somewhat obliquely truncate, with 2 pairs of anal cirri, long, filiform, non-articulated dorsal pair and short, stout ventral pair (Fig. 2K). Mandibles anteriorly flared, with 2 fused and 3 free teeth on each side (Fig. 2D); first inner tooth a plate with a major denticle and lot of spinelets, other with small denticles on elongate median edge; mandibles fused posterior to denticles of inner teeth, posteriorly elongate. Maxillae with pair of carriers, left carrier appears ramified, 2 pairs of basal plates, 2 paired rows of free denticles continuous with basal plates (Fig. 2B,C). Inferior basal plates with slender, evenly spaced, relatively slender teeth. Superior basal plates with broad teeth interspersed by smaller ones. Posterior inferior free denticles with about four teeth, decreasing in size anteriorly, gradually changing to finely toothed plates. Posterior superior free denticles larger, each with curved main fang and several smaller teeth, decreasing in size anteriorly, gradually changing to small denticle with four evenly spaced teeth.

Remarks.—This species is close to *P. kefersteini* (Orensanz, 1973; Perkins, 1979), but differs in the form of parapodia (slenderer, and clearly more elongate subacicular lobes), the more proximal position of the ventral cirrus, in the shape of the furcate setae and especially in having very large and curved superior free denticles. From *P. bifida* Perkins, 1979, the new species differs in the form of the prostomium, eyes, mandibles and parapodia, and in the form of the furcate setae. From *Protodorvillea* sp. (sensu Hartman, 1967; Orensanz, 1990) it differs in having eyes, in the form of the parapodia, the form of the furcate setae, and the blades of the compound setae with larger secondary tooth.

Etymology.—The species is named in honor of Dr. José M. Orensanz who has studied extensively austral eunicemorph polychaetes.

Acnowledgments

We are grateful to N. Rozbaczylo and L. Aburto for their assistance with literature and in the field respectively. The support of the Chilean Fund for Science and Technology (FONDECYT, Grant no. 5960001) and Environmental Program of Minera Escondida Ltda., Antofagasta, Chile, are gratefully acknowledged. We wish also to thank to two reviewers for constructive criticisms.

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